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ABSTRACT

The study described in this paper is built on previous research, and applies, tests, and develops an analytic framework to examine teachers' thinking about teaching and learning across subject areas--specifically, contrasts between approaches to mathematics and environmental studies or science. The Teachers' Thinking about Teaching and Learning (TTTL) project responds to two distinct but related problems formulated in the context of a changing curriculum: (1) What do teachers think about their own teaching and pupils' learning? and (2) How can more be learned about teachers' thinking with respect to teaching and learning? Pre- and post-lesson interviews were conducted with elementary and secondary school teachers (N=21); a series of four lessons in one curriculum area were observed; and a few weeks later a follow-up interview was conducted. The teachers selected for this research were working with children at P2 (6-7 years), P4 (8-9 years), P7 (11-12 years), and S2 (13-14 years). This approach to data collection generated a larger number of loosely structured and varied teacher accounts of teaching and pupils. The bulk of the paper analyzes the transcripts of the accounts. Appendixes provide the research questions, edited transcripts from a post-lesson interview with a P2 teacher after math and environmental studies sessions, and ideas used by the P2 teacher in evaluating the lessons. (LL)

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ED 362 513

A FRAMEWORK FOR ANALYSING TEACHERS' ACCOUNTS OF PUPILS AND TEACHING

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Paper presented at the Annual Conference of the
British Educational Research Association
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ABSTRACT

The presenters are working on a project, funded by the Economic and Social Research Council (ESRC), which explores teachers' thinking about teaching and learning. In analysing teachers' accounts of what they do in the classroom the project team is applying, testing and developing an analytic framework originally formulated by Brown and McIntyre (Making Sense of Teaching, 1993).

The presentation takes the form of a workshop in which the framework is introduced in the context of the current research, and participants are then invited to apply the framework to a sample transcript. The presenters view this as an opportunity to test the application of the framework (for instance, 'Do different individual analysts achieve broadly similar outcomes when applying the framework?'), and for more general critical discussion of the rationale underlying this research tool.

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INTRODUCTION

BERA seems to be the obvious place to discuss research methods for educational research. At the annual conference, however, such discussion is relatively rare. That may be because talking about methods is boring or because it is accepted that education is an area of activity which 'borrows' its methods from more traditional disciplines in order to address its own questions. Discussion about methods, therefore, would be expected to occur frequently at conferences on sociology, psychology, history, statistics, and so on, but not at BERA. At BERA we have substantive themes (this year 'partnerships in educational research') which encourage presentations of findings and debate about policies and practices, but not about methods.

Straight 'borrowing' of methods, however, is likely to be inadequate to address all our research questions. We may have to adapt those methods developed elsewhere, or even develop some of our own. In the research which underpins this paper the interest is in gaining access to teachers' thinking about their own teaching so we can learn more about their professional craft knowledge. It is especially important that we avoid the pitfalls of some traditional approaches where teachers tell us (in interview or questionnaire) what they think we want to hear or what they see as some idealised model, or where researchers' ideas are imposed (through observation schedules or semi-structured interviews), or where teachers become defensive as a result of explicit or implicit emphasis on deficits in their practice.

Traditionally, teachers are not expected to discuss their craft knowledge, but we set out to encourage them to do precisely this. We observe and <u>immediately</u> interview the teachers, analyse the ideas they present and return them, seeking their validation on the extent to which our analysis reflects the thinking underlying their classroom activities. (The analytic framework which structures one aspect of our analysis builds on earlier research

by Brown and McIntyre, 1993, who developed the tool during the analysis of teachers' talk about their classroom work.)

In particular, we ask teachers to focus on what they consider has gone well in their lessons, and it may be that this positive emphasis will have an overall impact on the data we collect about the ways teachers construe their work; and, in the longer term, the re-presentation of the teachers' ideas within the context of the analytic framework may also influence the way their thinking develops. In this session, however, we are concerned with the analysis of what teachers tell us about their teaching immediately after it has taken place. While we accept that we cannot gain direct access to their thinking as they teach (knowing in action, reflecting in action), we have some confidence that our approach takes us close to that.

In our ESRC funded project, we have a special interest in exploring differences in teachers' thinking across subject areas, namely contrasts between approaches to mathematics and environmental studies (in general), or science (in particular). We anticipate that application of the framework will throw into relief variations in the ways teachers construe the teaching of these subjects.

In the future it may be the case that our analysis and findings will help students to develop a language with which to talk to experienced teachers about the ideas guiding their classroom practice. The outcomes of our work may also have scope for helping to develop relationships between students and school-based mentors, or to enhance the sharing of professional knowledge among experienced teachers. At this stage, however, we are concerned only with the analysis of one kind of teacher talk which we believe reflects one aspect of their thinking about their work.

Our research assumes that teachers' perspectives on teaching and learning are crucial to any curriculum development programme.

The formulators of a partnership model, with centralised policy-makers working in alliance with teachers, should assume the same and so may have an interest in both our methods and our findings.

This paper offers a brief account of the research as a whole, to show the context in which the analytic framework is being applied, then takes one aspect of the analysis as an illustrative workshop.

THE RESEARCH QUESTIONS

The Teachers' Thinking about Teaching and Learning (TTTL) project is a response to two distinct but related problems formulated in the context of a changing curriculum: the theoretical problem

> What do teachers think about their own teaching and pupils' learning?

and the practical problem

> How can we learn more about teachers' thinking with regard to their teaching and pupils' learning?

The project is thus concerned both with answering questions of 'what is the case?' about teacher thinking, as well as developing methods for gaining such insights.

The changing curriculum to which reference is made is the Scottish version of the national curriculum published over a period of six years since the appearance in November 1987 of the Scottish Education Department's Curriculum and assessment in Scotland: a policy for the 90s.

This curriculum was not enacted in the legislation, but one year after the arrival of the consultation document the Secretary of State for Scotland announced

> The Government are [sic] to press ahead with a review of the balance of the primary curriculum, and with the production of new guidelines for each of the subject areas for age group 5-14. There will be parallel guidelines for parents, and a new pupil report card. There will be new guidelines on assessment across the whole curriculum, and the introduction of nationally standardised tests in English and mathematics in Primary 4 [8-9 year olds] and Primary 7 [11-12 year olds]. (Scottish Education Department press notice, 3rd October 1988, p. 1).

The Government's conclusions have since become policy, with the exception of its initial proposals for nationally standardised tests (following dissatisfaction and non-compliance on the part of many teachers and parents, the original plans for national testing did not progress beyond pilot testing in 1991). Revised plans for the school year 1992/93 required that all pupils between the ages of 5 and 12 be tested when, in the professional judgement of their teachers, they had reached a new level of attainment. In a large (but as yet undetermined) number of schools this has not happened. Testing is due to be introduced for S1 and S2 pupils from January 1994; again, there is some doubt about the extent to which the regions will comply with the SOED's timetable.

Among other things, the guidelines have formally introduced into the Scottish 5-14 curriculum discussion of attainment outcomes, strands, and attainment targets at five levels. In addition to controversy and changes of plan in relation to national testing procedures, the progress of the environmental studies guidelines has also been chequered. The working paper for environmental studies - a broad curricular area, historically viewed by the SCCC as "applying elements of geography, history, health, science and technology to practical situations, projects and themes" (SCCC, 1990, p 3) - was published in December 1991, but the final guidelines did not become available until March 1993 (some twenty months after the publication of the maths guidelines).

Our research is concerned, in part, with whether the Scottish reforms are likely to influence the ways teachers make sense of their classroom experience, in particular their underlying ideas about teaching and learning. By building on recent research into teachers' professional craft knowledge and the inter-relationships between assessment, teaching and learning, the TTTL project explores these issues in the context of maths (scheduled to have national testing) and environmental studies (not scheduled for national testing). The primary aims are to develop our understanding of: (a) how teachers construe effective teaching, and the assumptions they make about how children learn; (b) how teachers interpret differences between pupils and cater for those differences, especially in relation to the use of attainment targets, national tests and assessment in general. Previous research (Brown and McIntyre, 1993) suggested that teachers tended to think in terms of patterns of activity rather than attainment targets. This prompted the general question of whether explicit attainment targets, as in the SOED's 5-14 guidelines, are having an impact on this aspect of teachers' thinking insofar as it relates to what they do in the classroom. The research questions generated by these concerns are listed in Appendix 1.

SCALE OF FIELDWORK

The research proposal envisaged that maths and environmental studies would be explored with teachers in four primary and four secondary schools. In the primary sector, the fieldwork would focus on both maths and environmental studies involving three teachers in each school, working with children at P2 (6-7 years), P4 (8-9 years), and P7 (11-12 years). In the secondaries, the research would be undertaken with one maths and one science teacher working with pupils at S2 (13-14 years) in each school.

In practice there have been minor changes. One of the primaries and one of the secondaries are under the same roof - an independent school with a primary and a secondary department.

Twenty-one teachers will be involved, rather than twenty, because environmental studies is taught as three distinct subjects, with a specialist teacher for science at P7 in the independent school. S2 pupils in the independent school are taught science as separate subjects of physics, chemistry, and biology, and so the fieldwork at S2 is being undertaken with the chemistry teacher. One group of P4 children has been observed within a composite P3/4 class, and a group of P2 children has been observed in a very small class, which also catered for a P1 pupil.

The schools are all within Scotland's central belt, two are Roman Catholic and two are inner city schools.

After our initial interview (lasting about forty-five minutes) with each teacher, a series of four lessons in one curriculum area (eight for each primary teacher, and four for each secondary teacher) are observed, with immediate post-lesson interviews. A few weeks later there is a follow-up interview (lasting about an hour). At a later stage each teacher will be re-interviewed with the intention of validating the outcomes of the analysis of the data. This concluding interview provides an opportunity to ask supplementary questions and tie up any loose ends. Interviews and observed lessons are recorded with the teacher wearing a radio-microphone. All interviews are subsequently transcribed. The project formally started at the beginning of May 1992, and is due to finish at the end of October 1994.

RESEARCH TOOLS AND METHODS

The main research tool is the interview, both open-ended and semi-structured, together with systematic and responsive lesson observation, and stimulated recall, whereby a short extract from a lesson is played back to the teacher for comment. This information is complemented by documentary analysis of worksheets, test papers, workbooks, and the official 5-14 documents.

One distinction we regard as important is between information which teachers volunteer in response to open questions and that obtained by the researcher asking direct questions. The former gives us an opportunity to gain access to the ways in which teachers themselves construe their teaching and pupils' learning; the latter tells us how they react to constructs which we, the researchers, have imposed. Because teachers' own thinking is our central focus, we have had to concentrate on minimising our influence on the teachers. In the initial interviews, for example, we have ensured as far as possible that the research questions are addressed through oblique forms of questioning, with some potentially suitable lines of approach kept in reserve for when the teacher says something which can be usefully explored.

By way of illustration: we want to know more about the ways teachers differentiate between pupils, to link this to specific pupils within the class, but we also want to avoid the use of loaded questions. We recognise that any one teacher may construe differences in a number of ways (for instance, according to progress, attainment, some general notion of ability, confidence, interest), and that a teacher's awareness and conception of pupil differences may also vary according to the subject area. We anticipate that teachers probably think mostly in terms of attainment, and that, for a number of reasons, primary school teachers have a clearer conception of pupil differentiation and attainment for maths than for environmental studies, but we do not want the questioning to presuppose that our expectations are correct.

A plausible way of getting at how a particular teacher differentiates would be through questioning about her or his organisation of the pupils, and by following this up with questions about why they are organised in this way. Once the teacher has revealed some of her or his thinking about the differentiation of pupils, the researcher can use the teacher's ideas to encourage elaboration, for instance by reference to

specific examples.

So the researcher's opening gambit for the initial interviews became:

> Can you tell me about this class and how you organise the pupils and their work in maths (or science or environmental studies - as appropriate)?

Probes of teachers' responses have been designed to reveal information about whole class teaching, grouping, and individual work. Supplementary questions may include: What will I be seeing when I observe the pupils in maths (or environmental studies, or science)?; Could you give me an illustration of that?; Could you tell me a bit more about this?; Is there anything else you think I ought to know?; Could you tell me the basis for the groupings?, Which pupils are in these groups?, Are these groups permanent?

Where the teacher uses achievement as the basis for differentiation, but doesn't work with banded groups, then questions of the following kind have been employed: Who is doing well? Who is not doing well? These questions are laden, however, with assumptions about pupils and how they may be differentiated, and are not introduced by the researcher unless the teacher has previously said something which indicates that she or he shares the assumptions.

The post-lesson interviews are more open-ended. The researcher asks a question of the kind: Can you say what you felt went well with this session? - inviting people to reflect on what has gone well is a good way of encouraging them to talk. Any subsequent questioning during the post-lesson interviews is as open-ended as possible, and is based on ideas which the teacher has already introduced.

This decision to rely entirely on teachers' introduction of ideas

has had one particularly interesting consequence, relevant to our interest in the impact of the 5-14 programme. In state schools the adoption of the 5-14 programme is, to all intents and purposes, compulsory; yet, of the sixteen initial interviews carried out so far, only seven teachers mentioned the 5-14 programme, and five of these came from the independent school. Of the two state sector teachers who referred to it, one mentioned the 5-14 levels because she thought the researcher was referring to these within a question (she was, in fact, mistaken).

This lack of voluntary data from teachers on 5-14 leads to conjectures about the impact (or its absence) of the SOED's programme which could not have arisen had we employed a more direct line of questioning in the early stages. However, the later follow-up interview is less open-ended and includes questions about the 5-14 programme. The practice of holding back in the early stages of the fieldwork does not preclude asking direct questions later, but it is important to remember that rather different kinds of claims will emerge from analysis of the two kinds of data.

Although the TTTL project involves the observation of a substantial number of lessons, the main purpose of this is to give the researcher and teacher shared classroom events as the focus for the post-lesson interview. It encourages the teachers to be specific and to avoid vague generalisations. The researcher tries to phrase questions in the past tense, to encourage the teacher to focus on what has happened during the shared events, rather than on some idealised or fantasised set of circumstances or on what she or he thinks the researcher wants to hear.

The project's approach to data collection generates a large number of loosely structured and varied teacher accounts of their own teaching and pupils. We turn now to the analysis of those accounts.

AN ANALYTIC TOOL

Brown and McIntyre's Making Sense of Teaching (1993) is an account of research designed to develop understanding of

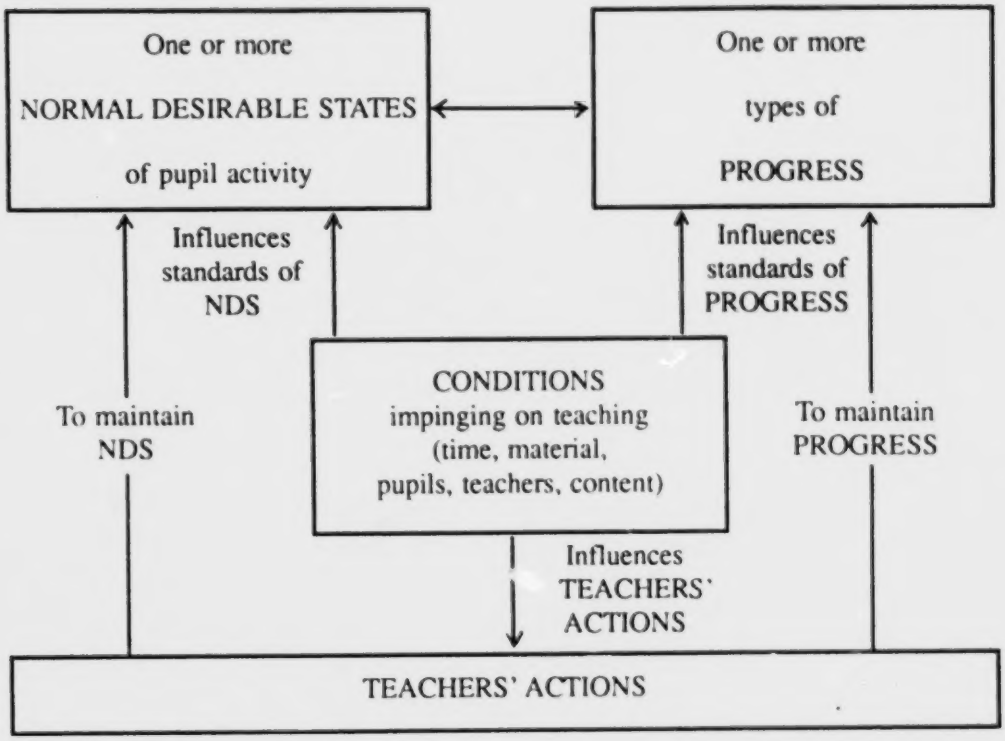
> "how teachers themselves make sense of what they do: how they construe and evaluate their own teaching, how they make judgements, and why, in their own understanding, they choose to act in particular ways in specific circumstances to achieve their successes." (p. 1)

Brown and McIntyre's research, like ours, rested heavily on data from interviews with teachers immediately after classroom events which were in some sense shared by the teacher and the researcher. Like us, although they accepted that the data collected could not fully reflect the teachers' mental processes accompanying and guiding their teaching, they saw in this strategy a way of getting as close as possible to these mental processes. They then developed an analytical framework grounded in the teachers' ways of talking about the reality of their own classrooms (eschewing espoused theories and models of teachers and teaching). This framework was then taken through a validation process with the teachers. In this context, validation does not address the question Are these teachers' ideas valid?; its focus is on Does the analytic framework adequately reflect what the teacher meant? An important criterion used throughout the analysis and formulation of the framework was that it should encompass everything the teachers said. Utterances which were not accommodated were scrutinized very carefully and their exclusion explicitly defended.

The TTTL project builds on Brown and McIntyre's work in a number of ways, and by applying the analytic framework the present research team are also seeking to test it. The earlier analysis led to teacher utterances being classified into four inter-related categories: two reflected teachers' goals (the normal desirable states of pupil activity they sought to maintain, and

various kinds of progress they wished to promote), teachers actions to maintain those activities or promote progress, and the conditions impinging on the teaching (time, material environment, pupils, the teachers themselves, and content). The figure below summarises the findings.

THE CONCEPTS WHICH TEACHERS USE IN EVALUATING THEIR OWN TEACHING



Teachers, in giving accounts of what had gone well in their teaching, focused mostly on <u>normal desirable states</u> of activity (NDSs), that is

> the achievement or maintenance of states of pupil activity which they took to be normally desirable for particular phases and types of lesson. (Brown and McIntyre, 1993, p.

110-111)

Success was sometimes perceived, however, as progress in

> pupils' confidence, attitudes, understanding or skills, in the completion of artefacts, in the coverage of work, or towards an NDS of activity. (p. 111)

There were only rare instances where success was related to the attainment of learning objectives (teachers were not specifically questioned on their planning, however). Certainly the ways in which the teachers appeared to be thinking about their classroom teaching could not be said to reflect the 5-14 programme where attainment targets are strongly emphasised.

A major finding in the earlier research was the importance teachers attached to the conditions which impinged on their teaching. In particular, these conditions had an influence on the standards which teachers expected pupils to achieve in NDS or progress goals, and on the choice of actions to achieve those goals.

Although Brown and McIntyre's text provides a detailed account, supported by a number of examples, the findings as a whole are nonetheless general and abstract. The TTTL project team are seeking not only to test the theoretical outcomes of the earlier work, but also to apply the analytical framework in two distinct areas. First, we are investigating teachers' constructs (their craft knowledge) in more specific circumstances, that is in maths and environmental studies. Secondly, we are operating with a wider age group (6-14), at four levels: P2, P4, P7, and S2. Thirdly, we are addressing the question of the impact of the SOED's 5-14 programme, especially its prescribed attainment targets. Because the guidelines for maths had been available fifteen months before the beginning of the fieldwork, while the guidelines for environmental studies were published seven months after we had started, we have the opportunity to explore

differences between a subject area with established guidelines and one where they have only recently been published.

USING THE FRAMEWORK

We now set out to provide clarification of how we are using the framework, by reference to two extracts from post-lesson interviews from the current project (Appendix 2 and 3). You are invited to think about what the teacher tells us in the first transcript concerning: (a) the patterns of pupil activity she wants to maintain and pupil progress she wants to promote, (b) the actions she has taken to achieve these goals, and (c) the conditions which she sees as impinging on the teaching (thus influencing the choice of action or the standards she hopes to maintain).

We illustrate the way we would go about analysing a post-lesson interview using this first example. In the longer term we are interested in bringing the outcomes of this process to bear on our research questions (see Appendix 1). For instance, does the teacher show signs of having been influenced by attainment targets within the 5-14 guidelines? In particular:

> To what extent is this teacher operating with goals relating to progress rather than to establishing or maintaining normal desirable states of pupil activity?

After working through the first extract with us, you are invited to apply the framework to the second extract (Appendix 3), using a worksheet based on the diagram offered on page 12.[1]

The first extract is taken from a post-lesson interview with a P2 teacher after a maths session.

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[1]See Appendix 4 for a small-scale copy of this worksheet. A one page summary of our analysis of the first extract is shown in Appendix 5.

Normal desirable states of pupil activity (NDSs)

What did the teacher tell us about pupils' normal desirable states of activity in this lesson? Our conclusion from this extract identifies:

(i) Group engaged in balancing activities, moving bricks on and off to achieve a balance.

(ii) (Negative) One pupil putting bricks on in handfuls.

(iii) Group doing problems.

(iv) Group discussing what they were doing with the teacher.

(v) Group looking at a problem to see what they had to do.

(Future activity: will use the computer for the next task.)

The following teacher utterances provide evidence of what she saw as normal desirable states of pupil activity (NDSs) for the balancing work:

> "They knew to take bricks off or to put them on, according to whether the potato was lighter or heavier.... and of how to count the number of bricks to make sure that that was the right amount. Ross started putting in handfuls ... [he was taken back to] put them in one at a time.... but we'll do comparisons.... So we'll do that on the computer."

The evidence for activity with problems is in the following:

> "We did some problems with this group here [red group].... look and see ... look at the problem and find out what they had to do. So we had to discuss that".

Progress

What did the teacher tell us about progress? We suggest that the pupils:

(i) Got the idea of balancing.

(ii) Got the idea of how to make it balance.

(iii) Got the idea of 'heavier' and 'lighter'.

(iv) Got the language of balancing and weighing.

(v) Came to know what they were doing.

The evidence for this is in:

> "So they got the idea of balancing, and of how to make it balance .... And I think they're getting the language of it now: weighing, and lighter, and heavier, and balancing, and that kind of language.... From that we'll compare on the computer, we'll carry on with that. We'll compare the number of bricks for a book, and make sure that they know the number of bricks corresponds to lighter and heavier - whichever is lighter is less bricks, and which is heavier is more bricks."

and

> "to make sure they know what they were doing first."

When looking for progress statements, there may be references to: (a) an advancement in learning, (b) progress that has been seen by the teacher to have been made through, say, topics, or the lesson in general, (c) the production of something (such as a piece of writing or a model), (d) affective growth such as building up confidence.

In some circumstances teachers want pupils to make progress so that an NDS can be established; in others a particular NDS is used to make progress. In our first example transcript we can see the teacher working with both kinds of idea: the balancing activities (NDSs) lead to increased understanding (progress), but this progress is a necessary basis for establishing new activities (NDSs), and so on.

There are occasions when it is difficult to determine whether the teacher is talking about progress or about the maintenance or establishment of a normal desirable state of pupil activity (NDS). The use of some words can be problematic in this respect, specifically 'understand', 'manage', and 'cope'. The significance of understand, for instance, is often ambiguous; it may be used to indicate that pupils are in a normal desirable state of understanding what is going on, or it may indicate progress in that the teacher judges that the pupils have come to understand something (as a consequence, for instance, of the teacher's actions). Sometimes the context of an utterance gives useful clues as to the teacher's meaning.

Teacher's actions

Returning now to the first extract (Appendix 2): what did the teacher tell us about her actions?

The teacher tells us relatively little about the actions she took:

(i) She showed one pupil how to put bricks one at a time.

(ii) She discussed with one group what they were supposed to be doing.

She tells us this when she says:

"and I had to take him back and put them in one at a

time.... We did some problems with this group here [red group].... we had to discuss that."

The teacher's actions in working with pupils, rather than merely setting them work to do, are an interesting feature of this transcript.

Although "we" is used by teachers when talking about what teacher and pupils do together, it may be a substitute for saying "the pupils". However, in this example the teacher had been observed working with the pupils during the lesson, so that when she says "We did some problems" and "we had to discuss that" it is known that this refers to her own actions as well as what she had arranged for the pupils to do. (Where she talks in the future tense about "we'll compare on the computer ... we'll carry on with that ... we'll do that on the computer" there is no clear evidence of the extent to which "we" really does refer to her actions rather than just the children's activities. Statements about the future are a different kind of data from those which relate to the observed set of events.)

Conditions

The next question of interest to us is What did the teacher tell us about the conditions impinging on teaching?

The conditions category contains five main sub-categories: pupil conditions, time conditions, material conditions, content conditions, and teacher conditions.

Pupil conditions are the most frequently cited and are sub-divided in several ways, for instance into enduring pupil conditions and on-the-day conditions. An enduring pupil condition may be a pattern of behaviour persisting over a long period of time, as in "They're a difficult class" (which is distinct from "They behaved badly this afternoon"), and a fixed characteristic as in "They'll never be any different" or "She's

a very bright girl".

In the case of the first extract, we summarise the teacher's perception of pupil conditions as follows:

(i) 3 pupils brought an existing understanding of 'lighter' and 'heavier' to the balancing activities.

(ii) One pupil tends to rush things, make mistakes, think he knows what to do. (Enduring)

(iii) One group of pupils were resistant to the task, wanted to do something else.

(iv) The group forgot what they had to do.

Of these only (ii) above seems to be an enduring pupil characteristic (note that the present tense is used).

These conditions emerge from the following text:

> "Peter understood lighter and heavier, and so did Ross and Bryan.... He [Ross] tends to do that, you know, rush into things, and that's where he makes mistakes, because he thinks he knows what to do and he carries on and does it, and then it doesn't work out quite right. But the idea of the balancing was alright there, they knew that...."

and

> "So that gave them [red group] a resistance to what they were doing now, because they wanted to count money rather than [doing what the activity required].... And then ... they wanted to put in ten pence in that one and ten pence in that one, and they'd forgotten they had to have two ... the same amount of coins, which was the difficulty."

Content conditions are also mentioned in the extract:

(i) The task (balancing) was straightforward.

(ii) The problem work was difficult, there were a lot of things to do.

(iii) The nature of the earlier work made pupils resistant to the new task.

This summary is drawn from:

> "That was a straightforward weighing one, one ... two"

and

> "That was quite difficult, there was quite a lot of things to do with that.... That was really quite difficult for them. Previously this week we had been counting coins. So that gave them a resistance to what they were doing now.... They had to have two ... the same amount of coins, which was the difficulty. And that was really quite hard."

Ambiguities and difficulties

We've already mentioned that some words and the way they are used can lead to ambiguity within what the teacher says. This extract provides us with an illustration of a possible ambiguity:

> "But the idea of the balancing was alright there, they knew that."

We've taken this to be a reference to something known prior to the activity undertaken, and thus a pupil condition, but it's possible the teacher meant that the pupils had 'come to know' during the course of the lesson, implying a statement about progress.

In analysing post-lesson interviews, we sometimes find utterances which do not fall exclusively into one category. In this extract, for example, "We did some problems with this group here [red group]" and "we had to discuss that" provide evidence of the teacher's thinking about normal desirable states of pupil activity and of her own actions.

Towards the end of the categorisation process there may seem to be some utterances which do not fit any of the four main categories. It is important not to discard too readily any aspect of what the teacher says, and so we note and scrutinise 'other uncategorised statements'.

In practice, very few utterances within the post-lesson interviews turn out to be significant and not encompassed by one of the existing categories. However, within each transcript there are usually a few words, and sometimes short phrases, which we dispose of after scrutiny. With the first extract we have discarded "Well, with the balancing I think it went fairly well", judged to contain no content beyond what the researcher has already said.

Many teachers also interpose their speech with "you know" and "I mean", and these are discounted. There are also occasions where a teacher will start to say something but then hesitate and put her or his ideas differently; where this seems merely to be an extended stutter, these words are not included in the analysis.

Drawing cautious conclusions

Of course, we are not drawing conclusions on the basis of the analysis of a section of one interview. Within our research we will be working with a total of 130 post-lesson interviews, and even where patterns are perceived, and where there is evidence which supports or contradicts previous conjectures, caution will be exercised in proposing explanations (as hypotheses for testing in later research). The intention here is merely to illustrate

the process.

However, on the evidence from this set of data we have no reason to infer that the teacher was putting more emphasis on progress goals than on the maintenance of normal desirable states of activity. She appeared to be concerned with both types of goal and with the interdependence of the two - the activity pattern led to progress, but progress was also justified as a means of establishing a new pattern of activity. There was no explicit mention of progress in relation to the 5-14 curriculum programme (we may find implicit reference when we do further analysis).

Inappropriate researcher intervention

It is not easy to ensure that researchers' ideas are not fed into the interview. There are two sections of text to which we have not yet referred, where the teacher clearly makes a statement about what the pupils in the balancing group had done before; this constitutes a pupil condition in terms of pupils' previous experiences and learning:

> "Balancing mostly, and finding which was lighter or heavier according to putting the scales up or down, and knowing that the scales would be going up or down, and if it was heavier it's down, and if lighter the pan is up, and when they balance they're equal, they're the same weight."

These utterances support earlier statements by the teacher, but they are the consequence of an inappropriate question on the part of the researcher. "How much weighing had they done before?" is a direct question reflecting the researcher's thinking rather than anything the teacher has previously said. Thus, while we are able to classify this series of utterances as evidence of the teacher's thinking with regard to a pupil condition, we need to bear in mind that this response was researcher-led.

There is a similar difficulty with the teacher's response to the

researcher's question "So was the counting new?". She tells us "The counting was quite new, yes. The idea ... counting one thing, then two things and three things; it's usually just been a comparison between lighter and heavier.", and this provides us with information about a content condition, but this was not unsolicited, and the relative importance of this condition in terms of the teacher's thinking should not be taken for granted.

Analysis of the second transcript (Appendix 3)

The second example transcript is from a post-lesson discussion with the same P2 teacher, this time following an environmental studies session. Again, we suggest analysing the extract in terms of:

> What did the teacher tell us about the patterns of activity of the pupils?
>
> What did the teacher tell us about progress?
>
> What did the teacher tell us about the conditions impinging on teaching?
>
> What did the teacher tell us about her actions?

Following the analysis you may like to consider:

> Is there greater emphasis on progress goals in relation to (a) the maths lesson or (b) the environmental studies lesson?

This type of question is with reference to a situation where the 5-14 maths guidelines (which emphasise attainment outcomes and targets) had been available for some time, whereas the final guidelines for environmental studies had only recently been published. Again, we emphasise that this activity is largely illustrative.

In working on the second transcript, workshop participants may become aware that individuals are categorising the material in slightly different ways. We do not anticipate complete consensus.

FEEDBACK ON THE RESEARCH AND THE FRAMEWORK

After tackling the second transcript, you are invited to offer feed-back; the research team seek both positive comments and constructive criticism in answer to the following questions:

> What did you feel went well in the process of analysing the transcripts?
>
> What did you come to understand by taking part in the practical activity?
>
> In what situations do you think the framework might be useful?
>
> What flaws (if any) do you perceive in the rationale behind the framework?
>
> What limitations and difficulties do you anticipate in relation to the practical applications and implications of the framework?

Correspondence in response to these questions is welcome, and may be sent to the authors at the address given at the beginning of the paper.

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APPENDIX 1

The research questions

(i) To what extent and in what ways are teachers' conceptions of their classroom goals influenced by the introduction of 'targets' which are characterised as 'strands' at different 'levels'? For example, are progress goals now more evident in their discourse? If so, are these conceptualised as achieving behavioural outcomes or as developing pupils' strategies?

(ii) How are the actions which teachers see themselves taking to achieve their classroom goals affected by the introduction of explicit and common 'targets'?

(iii) Are there distinguishable differences between areas of the curriculum with 'national testing' and those without? Or between stages where there is national testing and those where there is not? Is it possible to distinguish different effects at work in primary and secondary schools?

(iv) Have these innovations affected how teachers evaluate the achievement of their goals? Are goals primarily expressed in terms of pupils' learning or are other criteria used? To what extent do new procedures for assessment/testing impinge on the ways in which teachers put value on what has been achieved?

(v) What kinds of evidence exist concerning the impact of the reforms on teaching and learning processes which are beyond the perceptions of teachers? For example, is there convergence towards selecting the same kinds of items to make up a test? Do teachers explicitly refer to targets and tests in their teaching?

(vi) How are teachers' conceptualisations of pupil 'conditions' influenced by the introduction of 'targets'? Is there, for example, a move away from generalised judgements about pupils (as 'able', 'slow', 'disruptive') towards a greater concern with specific information about the pupils' prior knowledge and existing conceptual frameworks? How do teachers cater for differences among pupils?

(vii) What assumptions about how children learn underlie the teachers' choice of pupil 'conditions' to which they pay attention, and the actions they employ in response to these conditions? Are they conscious of any change in this resulting from the curriculum reforms? In particular, are they aware of providing a broader range of curriculum and assessment opportunities for <u>all</u> pupils?

(viii) Does the introduction of assessment guidelines influence the ways in which teachers formulate judgements about the pupils' 'conditions', including the ways they choose actions to achieve their goals and monitor the achievement of those goals?

(ix) Are there differences in effect between areas of the curriculum with national testing and those without? Or between stages with national testing and those without? Or between primary and secondary sectors?

(x) Are there differences associated with subject specialisms? For example, are the strands in each subject area regarded as conceptually distinct? If so, are teachers encouraged to move away from global judgements about pupils' abilities so that pupils are expected to reach different levels on different strands?

APPENDIX 2

Edited transcript from a post-lesson interview with a P2 teacher after a maths session (May 1993)

Key to abbreviations: T = teacher R = researcher

R Can you say what you felt went well with this session?

T Well, with the balancing I think it went fairly well. Peter understood lighter and heavier, and so did Ross and Bryan. They knew to take bricks off or to put them on, according to whether the potato was lighter or heavier. So they got the idea of balancing, and of how to make it balance, and of how to count the number of bricks to make sure that that was the right amount.

Ross started putting in handfuls, and I had to take him back and put them in one at a time. He tends to do that, you know, rush into things, and that's where he makes mistakes, because he thinks he knows what to do and he carries on and does it, and then it doesn't work out quite right.

But the idea of the balancing was alright there, they knew that. And I think they're getting the language of it now: weighing, and lighter, and heavier, and balancing, and that kind of language. That was a straightforward weighing one, one ... two; but we'll do comparisons. From that we'll compare on the computer, we'll carry on with that. We'll compare the number of bricks for a book, and make sure that they know the number of bricks corresponds to lighter and heavier - whichever is lighter is less bricks, and which is heavier is more bricks. So we'll do that on the computer.

R How much weighing had they done before?

T Balancing mostly, and finding which was lighter or heavier according to putting the scales up or down, and knowing that the scales would be going up or down, and if it was heavier it's down, and if lighter the pan is up, and when they balance they're equal, they're the same weight.

R So was the counting new?

T The counting was quite new, yes. The idea ... counting one thing, then two things and three things; it's usually just been a comparison between lighter and heavier.

R So they picked that up very quickly.

T Yes, uh uh.

We did some problems with this group here [red group]. That was quite difficult, there was quite a lot of things to do with that.

R Was that the pockets?

T The pockets, yes.

That was really quite difficult for them. Previously this week we had been <u>counting</u> coins. So that gave them a resistance to what they were doing now, because they wanted to count the money, rather than look and see ... look at the problem and find out what they had to do. So we had to discuss that to make sure they knew what they were doing first. And then we had to ... they wanted to put ten pence in that one and ten pence in that one, and they'd forgotten they had to have two ... the same amount of coins, which was the difficulty. And that was really quite hard....

APPENDIX 3

Edited transcript from a post-lesson interview with a P2 teacher after an environmental studies session (May 1993)

Key to abbreviations: T = teacher R = researcher

R Can you say what you felt went well with the session?

T Well, the interest was ... high level of interest. They really enjoyed looking at it [human skeleton], they wanted to touch it. And I think the idea that they could feel it and touch it and look at it, and it is a proper skeleton, gave them an impact, and it took their attention right away and I kept the high level of interest going, although it did get a bit out of hand sometimes. One or two of them got a bit excited about it. But I think to have a high interest helps a lot, it gives them a ... it's better than just a picture which you can talk about, and not ... you can feel parts of the body. But they could see the actual bones, and then feel it in themselves, which helped a lot.

We didn't get round to the movement of the body, but we can do that later on.

That was quite good.

They did the sheet alright, they managed, they found ... they'd no idea of the names of bones. So that was good too, because they found where the names of the bones, and where they were, 'cos they're shown on the poster, and they were able to relate it to the sheet once they got back. So I thought that went fairly well too. So they've identified different parts of the body, found out where they were in their own bodies, and found the names, which was what really I was intending.

R Was there anyone in particular that you thought did well - at the beginning of the lesson or later on?

T I thought Michael Thompson did well because he could pinpoint them right away, he knew exactly where they were. He was more ... some of them were a bit slightly hysterical about finding the bones, and what they would do; and Peter with his "spare ribs", which they found highly amusing. But he was interested in it for itself, really, rather than ... he wanted to find out where they were in his body, and he kept prodding himself and having a poke and a feel, so that he could find them himself. And he knew all the parts when they were putting the names up on the picture, he knew where the parts were. He did well.

Peter was very unsettled this afternoon, so he didn't do terribly well ... he got the parts alright, but he lacked interest in it, really; after the initial impact he went off slightly.

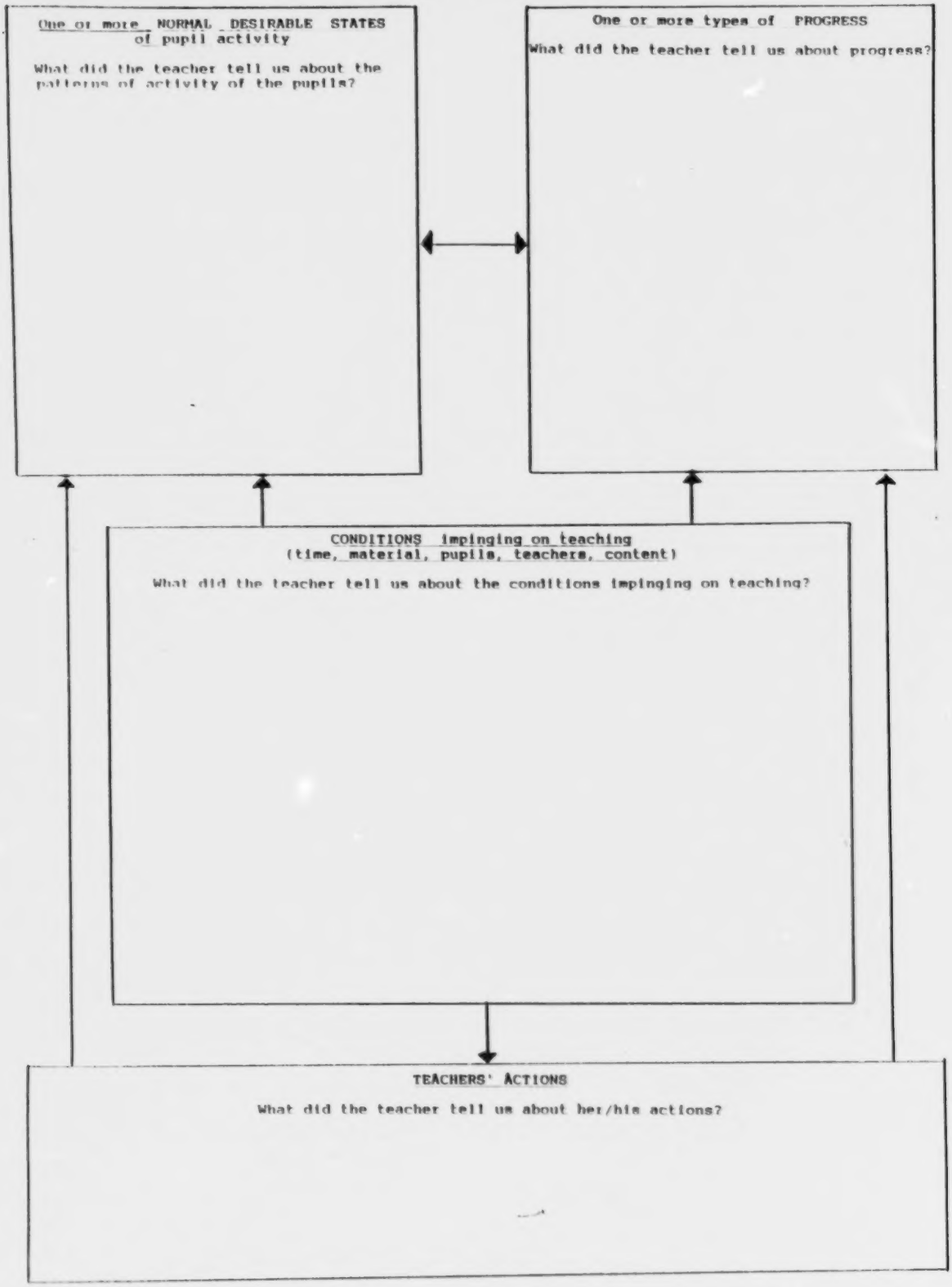
R When they started working at the desks was there anyone that you felt was responding well at that stage in particular?

T Jamie. Jamie did, but Jamie generally does with everything, you know, he responds fairly well to all these things.

And Iain and Carol Ann, both in that group there, they did quite well. And Donna too, she managed, she did well when they started at the desks. Jamie managed the other sheet by himself; the other two [in red group] needed a bit of help with that sheet. Although it is quite a difficult sheet, I think, for some of them to read. I'll have to go over that with the rest of them....

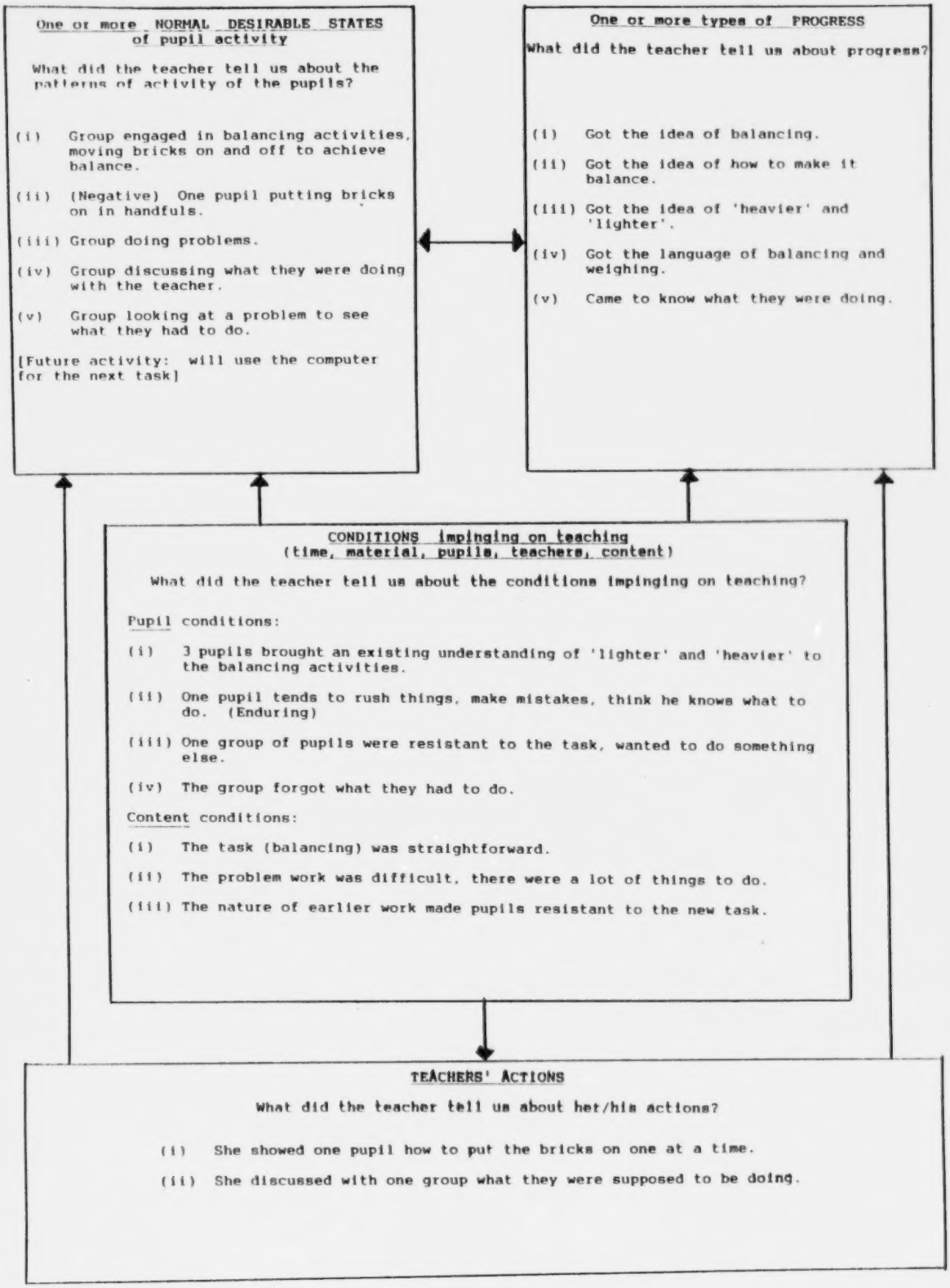
APPENDIX 4

IDEAS USED BY THE P2 TEACHER IN EVALUATING HER ENVIRONMENTAL STUDIES LESSON


One or more NORMAL DESIRABLE STATES of pupil activity
What did the teacher tell us about the patterns of activity of the pupils?
One or more types of PROGRESS
What did the teacher tell us about progress?
CONDITIONS impinging on teaching
(time, material, pupils, teachers, content)
What did the teacher tell us about the conditions impinging on teaching?
TEACHERS' ACTIONS
What did the teacher tell us about her/his actions?

APPENDIX 5

IDEAS USED BY THE P2 TEACHER IN EVALUATING HER MATHS LESSON


One or more NORMAL DESIRABLE STATES of pupil activity
What did the teacher tell us about the patterns of activity of the pupils?
(i) Group engaged in balancing activities, moving bricks on and off to achieve balance.
(ii) (Negative) One pupil putting bricks on in handfuls.
(iii) Group doing problems.
(iv) Group discussing what they were doing with the teacher.
(v) Group looking at a problem to see what they had to do.
[Future activity: will use the computer for the next task]
One or more types of PROGRESS
What did the teacher tell us about progress?
(i) Got the idea of balancing.
(ii) Got the idea of how to make it balance.
(iii) Got the idea of 'heavier' and 'lighter'.
(iv) Got the language of balancing and weighing.
(v) Came to know what they were doing.
CONDITIONS impinging on teaching (time, material, pupils, teachers, content)
What did the teacher tell us about the conditions impinging on teaching?
Pupil conditions:
(i) 3 pupils brought an existing understanding of 'lighter' and 'heavier' to the balancing activities.
(ii) One pupil tends to rush things, make mistakes, think he knows what to do. (Enduring)
(iii) One group of pupils were resistant to the task, wanted to do something else.
(iv) The group forgot what they had to do.
Content conditions:
(i) The task (balancing) was straightforward.
(ii) The problem work was difficult, there were a lot of things to do.
(iii) The nature of earlier work made pupils resistant to the new task.
TEACHERS' ACTIONS
What did the teacher tell us about her/his actions?
(i) She showed one pupil how to put the bricks on one at a time.
(ii) She discussed with one group what they were supposed to be doing.